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EXAMINER	
HUANG, DAVID S	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/522,470	HEIJNA, ROELAND JOHN	
	Examiner	Art Unit	
	DAVID HUANG	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 05 June 2009.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 7 is/are allowed.

6)☒ Claim(s) 1-6 and 15 is/are rejected.

7)☒ Claim(s) 8-14 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, with respect the requirement for restriction/election have been fully considered and are persuasive. Therefore, the restriction requirement has been withdrawn and examination of all claims follows.

2. Applicant's arguments with respect to claims 1 and 3 have been considered but are moot in view of the new ground(s) of rejection.

3. Applicant's arguments with respect to claims 4 and 5 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

4. **Claims 1, 3 and 15** are objected to because of the following informalities:

Claim 1 has been amended to remove all the reference characters in the claims, but line 6, retains the reference character "(B)". This should be removed to improve consistency in the claims.

Claim 3 is dependent on claim 1, and contains the same defects.

Claim 8, line 12 should be indented.

Claim 8, line 14 recites "<u>route</u> mean square" but should be -<u>root</u> mean square-.

Claim 9 is dependent on claim 8, and contains the same defect.

Claim 10, line 3 recites "<u>route</u> mean square" but should be -<u>root</u> mean square-.

Claim 11, line 12 recites "<u>route</u> mean square" but should be -<u>root</u> mean square-.

Claims 12-14 are dependent on claim 11, and contain the same defects.

Claim 15, lines 3-4 recite, "the first and the second (B) signal level," using only a reference character "(B)" for the "second signal level" limitation, but not the "first... signal level" limitation. The reference character should be removed to improve consistency in the claims.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 15 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 recites the limitation "the first and the second (B) signal level" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. It is suggested to applicant to amend the preamble of claim 15 to more closely match that of claim 1 to provide the proper antecedent basis for the limitations recited in lines 3-4.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1, 3, and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Little (US 2003/0081697).

Regarding **claims 1 and 15**, Little discloses a method of setting a slice level in a binary signal in presence of noise, the binary signal having a first signal level during a first signal portion and a second signal level during a second signal portion, the method comprising the steps of:

setting the slice level initially at a level intermediate the first and the second (B) signal level (set slicer threshold 140 at midpoint between the inner edges of the data eye 100, 200, Fig. 1 and 2, page 4, [0043]),

providing a noise indication by measuring a first noise level during the first signal portion and by measuring a second noise level during the second signal portion wherein measuring the respective noise levels involves detecting peaks in the binary signal to (minimum detector 510 tracks the lower boundary of the portion of the data eye that represents binary one, page 3, [0034], and peak detector 520 tracks upper boundary of data eye that represents a binary zero, page 4, [0038], for tracking the inner edge of the data eye), and

adjusting the slice level substantially uniformly during both the first and the second signal portions (page 1, [0016], threshold defines between binary one and binary zero), using the noise indication and as a function of an asymmetrical distribution in the first noise level and in the second noise level (threshold set according to separately determined minimum value of binary one and maximum value of binary zero, minimum detector 510 and peak detector 520, Fig. 5, page 4, [0043], Fig. 7, see also Fig. 2, data eye with noise and jitter),

the step of adjusting the slice level includes adjusting the slice level substantially uniformly during both the first and the second signal portions (page 1, [0016], threshold defines between binary one and binary zero; the same threshold is used to distinguish between both binary zero and one).

Little fails to expressly disclose indicating that the noise peaks in the respective first and second portions have on average different magnitudes.

However, Little discloses separately determining the minimum amplitude data of binary ones and the maximum amplitude data of binary zeros (page 4, [0044], Fig. 5, minimum detector 510, and peak detector 520). Thus it is implicit that the peaks or minimums detected for binary ones or binary zeros would indicate different magnitudes since they measure different values (binary one versus binary zero).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to specify the minimum detector 510 and the peak detector 520 of Little indicate the noise peaks for binary one and binary zero have on average different magnitudes since it is implicit that these detectors measure different values.

Regarding **claim 2**, Little discloses a method of setting a slice level in a binary signal in the presence of noise, the binary signal having a first signal level and a first noise level during a first signal portion, and a second signal level and a second noise level during a second signal portion, the method comprising:

setting the slice level to a value about equal to half the difference between the magnitudes of the first and the second signal levels (page 4, [0043]-[0044], Fig. 7, Fig. 5).

Little fails to expressly disclose minus half the difference between the magnitudes of the first and the second noise levels.

Nevertheless, Little discloses received signal are accompanied by noise and/or jitter (Fig. 2, page 1, [0004]). Thus, the minimum detector for binary one values and peak detector for binary zero values, implicitly measures the received signals plus their respective noise (page 1, [0019]). Thus, the slicer threshold method shown in Fig. 7, discloses the same method as claimed since both methods find the midpoint between the inner edges of the data eye (see Fig. 3 in specification of current application).

Therefore, it would have been obvious to one of ordinary skill in the art to specify the method of calculating the slicer threshold of Little in the same terms as claimed since the peak and minimum detection of Little implicitly measure the received signals plus their respective noise components for the inner edge of the data eye and is equivalent to the claimed method.

2. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Little (US 2003/0081697) in view of Manzer (US 4,666,046).

Regarding **claim 3**, Little discloses everything applied to claim 1, but fails to expressly disclose detecting peaks smaller than about 50 mV in at least on of the respective first and second portions of the binary signal.

Nevertheless, Little discloses Fig. 2 with the data eye with distribution of binary ones and binary zeros, with the slicer threshold in the range of 0.5 volts which is 500 mV. The variations amongst the points for binary ones and binary zeros are extremely small, and could reasonably construed to be on the order of 10 mV.

Manzer discloses a peak detector with a threshold in the range of 25 mV to 1.2 V. Thus, a peak detector is known in the art to distinguish between peaks on the level of 25 mV (col. 8, lines 53-55).

Because both Little and Manzer disclose peak detectors, it would have been obvious to one of ordinary skill in the art to substitute one peak detector for the other for the predictable result of providing peak detection for peaks in the range of 25 mV (i.e. smaller than about 50 mV).

7. **Claims 4 and 5** rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaraj (US 6,041,084) in view of Little (US 2003/0081697).

Regarding **claim 4**, Nagaraj discloses a device for setting the slice level in a binary signal in the presence of noise, comprising:

a first level shifter (VOS 18, Figure 4) coupled between a pair of input terminals (V_{OP} and V_{ON}, Figure 4) for receiving the binary signal (V_{OP} and V_{ON}, column 3, lines 57-59, Figure 4) and a pair of output terminals (V_{OP2}, V_{ON2}, Figure 4) for supplying and adjusted binary signal,

a second level shifter coupled to the pair of input terminals (V_{OS} 18, Figure 4, also interpreted to be the "second" level shift means, since it also provides shifted input signals to the noise peak detection below),

a noise peak level detection unit (20H and 20L, Figure 4) that receives shifted input signals and producing a noise indication signal (offset voltage VOS, column 3, line 65 - column 4, line 4, Figure 4) indicative of any difference in noise levels between signal portions of the

binary signal having different signal levels, the noise peak level detection unit coupled to the second level shifter (Fig. 4), and

an adjustment connection for feeding the noise indication signal to both the first and the second level shifters so as to compensate for any difference in the noise levels (column 4, lines 2-8, Integration 28, Figure 4).

However, Nagaraj fails to expressly disclose (i) the first shifter subtracts the noise indication signal from the signal levels of the binary signal to produce the shifted input signals, and (ii) the shifted input signal account for the noise peaks in the respective first and second portions having on average different magnitudes, and wherein the slice level is adjusted substantially uniformly during both the first and the second signal portions and is adjusted as a function of an asymmetrical distribution in the first noise level and in the second noise level.

With respect to (i), Nagaraj teaches that offset voltages are opposite polarity so that V_{OS} adds to V_{ON} and subtracts from V_{OP}. In reference to Figs. 5D and 5E, the absolute value of each of the differential binary signals is reduced, and moved towards zero. Thus, it is implicit that V_{OS} is subtracted from the value of the binary signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to specify the first shifter subtracts the noise indication signal from the signal levels of the binary signal, since it is implicitly taught by Nagaraj that by applying offset voltages of opposite pluralities, the absolute value of each signal is subtracted by the offset value.

With respect to (ii), Little discloses determining a slicer threshold by finding the midpoint between the inner edges of the data eye using minimum amplitude data of a binary one and

maximum amplitude of a binary zero (page 4, [0043]-[0044], Fig. 7). Little specifies that prior art slicers find the midpoint between the outer edges of the data eye and are inaccurate (page 1, [0007]). Little also discloses separately determining the minimum amplitude data of binary ones and the maximum amplitude data of binary zeros (page 4, [0044], Fig. 5, minimum detector 510, and peak detector 520). Thus it is implicit that the peaks or minimums detected for binary ones or binary zeros would indicate different magnitudes since they measure different values (binary one versus binary zero).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made modify Nagaraj to perform negative peak (minimum) detection on the Vop2 output, and positive peak (maximum) detection on the Von2 output to enable detection of the inner edge of the data eye and improve accuracy. Furthermore, it would have been obvious to specify the minimum detector 510 and the peak detector 520 of Little indicate the noise peaks for binary one and binary zero have on average different magnitudes since it is implicit that these detectors measure different values.

Regarding **claim 5**, Nagaraj and Little disclose everything claimed as applied to claim 4 above, and further discloses the noise peak level detection unit includes a first peak detector for detecting peaks in a first signal level of the binary signal and supplying a first peak detection signal (Peak Det 20H and V_{P1}, Figure 4), a second peak level detector for detecting peaks in a second signal level of the binary signal and supplying a second peak detection signal (Peak Det 20L and V_{P2}, Figure 4), and a differential amplifier for amplifying a difference between the first and the second peak detection signals to produce the noise indication signal (AND 26, column 3, line 65 - column 4, line 2, Figure 4).

8. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaraj (US 6,041,084) in view of Little (US 2003/0081697) as applied to claim 5 above, and further in view Bradbeer (US 5,130,543).

Regarding **claim 6**, Nagaraj and Little disclose everything claimed as applied to claim 4 above, but fail to expressly disclose the adjustment connection includes a low-pass filter for filtering the noise indication signal.

Nevertheless, Nagaraj does disclose the output of the differential amplifier 26, is integrated by an integrator circuit.

It is well known in the art that integrators are implemented as low pass filters as evidenced by Bradbeer (column 18, line 68 - column 19, line 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to specify the integrator circuit taught by Nagaraj to be a low pass filter as claimed because low pass filters are well known in the art to be used as integrators.

Allowable Subject Matter

1. **Claims 7** is allowed.

2. **Claims 8-14** are objected to for formal matters, but would be allowable if rewritten to address the defects noted above.

3. The following is a statement of reasons for the indication of allowable subject matter: The present invention also discloses a device for setting the slice level in a binary signal in the presence of noise with first and second shift means, a noise peak level detection means and an adjustment connection. The closest prior art, Nagaraj (US 6,041,084), teaches a similar device

with variable voltage offset voltage sources, peak detectors, a differential amplifier, and a feedback integrator. However, Nagaraj fails to disclose that the shifting means comprise a series connection of a resistive element, a transistor, and a current source, wherein the bases of the transistors being coupled to receive the noise indication signal (as recited in claim 7). Nagaraj also fails to disclose the noise peak level detection means comprise a RMS level detector and the first and second differential amplifiers for supplying level compensated noise signals to the peak detectors (as recited in claims 8, 10 and 11). These limitations distinguish claims 7-14 over the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID HUANG whose telephone number is (571)270-1798. The examiner can normally be reached on Monday - Friday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSH/dsh
9/14/09
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